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(54) Title: SIGNAL PROCESSING WITH REDUCED COMBINATORIAL COMPLEXITY
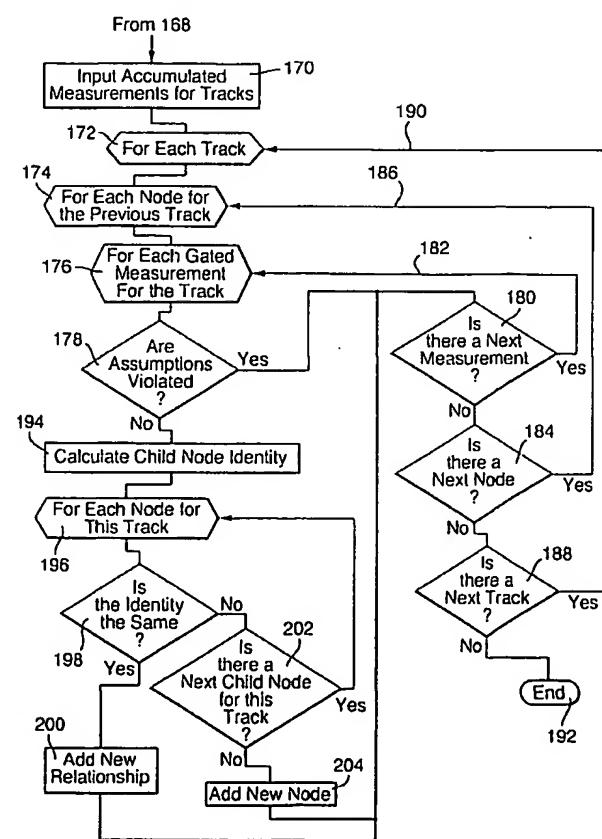
(57) Abstract: Signal processing with reduced combinatorial complexity for tracking evolving phenomena such as radar tracks associated with weighted measurement parameters includes selecting a current phenomenon and obtaining a set of measurement parameters associated with it. Beginning at a start node providing a first parent node having an identity, an identity for a child node of the parent is produced from the set of parameters, the parent identity and a parameter selected from the set and corresponding to the child. This is iterated for other parameters in the set. Child nodes of like identity for the phenomenon are treated as a single node with multiple parameter relationships associated with at least one parent node, whereas child nodes with differing identities are represented as separate nodes. The process is iterated for other phenomena and associated sets of measurement parameters, but child nodes of a previously processed phenomenon are now treated as parent nodes of a phenomenon processed immediately following. Updated sets of parameter weights associated with respective phenomena are derived by iterating over node relationships and identities. This provides a probabilistic assessment of track evolution.

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